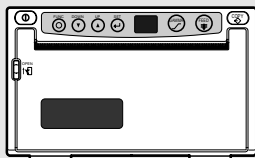# ▲ MITSUBISHI

$C \epsilon$

DIGITAL MONOCHROME PRINTER

MODEL

P91DW

OPERATION MANUAL

THIS OPERATION MANUAL IS IMPORTANT TO YOU.
PLEASE READ IT BEFORE USING YOUR DIGITAL MONOCHROME PRINTER.

DIGITAL MONOCHROME PRINTER

This digital monochrome printer complies with the requirements of the EC Directive 89/336/EEC, 73/23/EEC, 93/42/EEC and 93/68/EEC.
The electro-magnetic susceptibility has been chosen at a level that gains proper operation in residential areas, on business and light industrial premises and on small-scale enterprises, inside as well as outside of the buildings. All places of operation are characterised by their connection to the public low voltage power supply system.

WARNING:
Use the AC power cord recommended as below and a parallel cable (Hewlett Packard C2951A, etc.) so as not to interfere with radio and television reception.
If you use other cables, it causes interference with radio and television reception.

WARNING:
Use the AC power cord according to the recommendations as below,
Case 1, 2, 3 and 4; in order to comply with UL2601-1 and CAN/CSA C22.2 No. 601.1.
Case 5; in order to comply with EN60601-1 and EN60950.

Case 1. Connect to the 120V receptacle of the room or the host equipment.
   The AC power cord should be UL or CSA approved and consist of type SJT, size 16 or 18AWG, length 2.5m or shorter cord with IEC320/C13 type, 125V 10A or higher rating connector and NEMA 5-15 type, 125V 10A or higher rating, Hospital Grade plug.
Case 2. Connect to the 230V receptacle of the room or the host equipment.
   The AC power cord should be UL or CSA approved and consist of type SJT, size 16 or 18AWG, length 2.5m or shorter cord with IEC320/C13 type, 250V 10A or higher rating connector and NEMA 6-15 type, 250V 10A or higher rating, Hospital Grade plug.
Case 3. Connect to the 120V receptacle of the host equipment.
   The AC power cord should be UL or CSA approved and consist of type SJT, size 16 or 18AWG, length 2.5m or shorter cord with IEC320/C13 type, 125V 10A or higher rating connector and IEC320-2.2/E type, 125V 10A or higher rating plug.
Case 4. Connect to the 230V receptacle of the host equipment.
   The AC power cord should be UL or CSA approved and consist of type SJT, size 16 or 18AWG, length 2.5m or shorter cord with IEC320/C13 type, 250V 10A or higher rating connector and IEC320-2.2/E type, 250V 10A or higher rating plug.
Case 5. Connect to the 230V receptacle of the room or the host equipment.
   The AC power cord should be VDE approved and consist of core size 1mm^2 or bigger, length 2.5m or shorter cord with IEC320/C13 type, 250V 10A or higher rating connector and CEE(7)VII type or IEC 320-2.2/E type, 250V 10A or higher rating plug.

NOTE:
This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules.
These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his or her own expense.
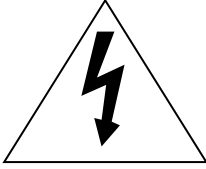
Information:
This class A digital apparatus complies with Canadian ICES-003.
Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

"CLASSIFIED BY UNDERWRITERS LABORATORIES INC.®
WITH RESPECT TO ELECTRIC SHOCK, FIRE AND MECHANICAL HAZARDS ONLY IN ACCORDANCE WITH UL2601-1 AND CAN/CSA C22.2 No. 601.1"
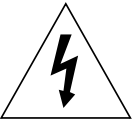
CAUTION

RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC
SHOCK,
DO NOT REMOVE COVER (OR BACK)
NO USER-SERVICEABLE PARTS INSIDE
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

The lightning flash with arrowhead symbol, within an
equilateral triangle, is intended to alert the user to the
presence of uninsulated "dangerous voltage" within the
product's enclosure that may be of sufficient magnitude
to constitute a risk of electric shock.

The exclamation point within an equilateral triangle is
intended to alert the user to the presence of important
operating and maintenance (servicing) instructions in the
literature accompanying the appliance.

WARNING:

TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE
TO RAIN OR MOISTURE.

**This product is to be employed with medical equipment, just for
reference purpose, not for medical diagnostic purpose.**

1 CONTENTS

2 | PRECAUTIONS

In the interest of safety, please observe the following precautions:

POWER REQUIREMENT

This Digital monochrome printer is designed for operation on 120/220-240V AC 50/60Hz in U.S.A and Canada, 220-240V AC 50/60Hz in Europe. Never connect to any outlet or power supply having a different voltage or frequency.

WARNING : THIS APPARATUS MUST BE EARTHED.
AVERTISSEMENT : CET APPAREIL DOIT ETRE MIS A LA TERRE.
This equipment is classified as class 1, type B according to the type of protection against electric shock.

PROTECTIVE MEASURES

IF ABNORMALITIES ARISE, . . .
Use of the unit during emission of smoke or abnormal sounds (without adopting countermeasures) is dangerous. In such a case, unplug the power cord from the source outlet immediately, and request maintenance services from the sales dealer.

NEVER INSERT ANY OBJECT INTO THE UNIT
Foreign objects of any kind inserted into this unit constitute a safety hazard and can cause extensive damage.
If any object should be inserted into the unit, unplug the power cord, then contact the sales dealer.

DO NOT PLACE ANYTHING ON THE UNIT
Heavy objects placed on the unit can cause damage or obstruct proper ventilation.

PROTECT THE POWER CORD
Damage to the power cord may cause fire or shock hazard. When unplugging, hold by the plug only and remove carefully.
Never put a heavy thing on the power cord. The cord may be damaged causing a fire or electric shock.

DO NOT PLACE WATER CONTAINERS ON THE UNIT
Do not place flower vases, and other water-holding containers on the unit. If, for some reason, water seeps to the inside of the unit, unplug the power cord from the source outlet, and contact the sales dealer. If used without corrective measures, the unit may be damaged.

DO NOT REMOVE THE CABINET
Touching internal parts is dangerous, besides, it may lead to malfunction. Contact the sales dealer to carry out internal checks and/or adjustments. Before opening the cover for eliminating a jammed paper, etc., be sure to disconnect the power cord plug.

PLACE THE UNIT ON A HORIZONTAL LEVEL
The unit is likely to be affected if it is placed in slanted conditions or in unstable places.

PROTECT AGAINST DEW FORMATION
In extremely cold regions, if the unit is moved quickly from an extremely cold place to a warmer one, dew is likely to be formed. If dew is formed, printing is not possible.

OPERATING AMBIENT TEMPERATURE RANGE
The operating ambient temperature range is 5°C-40°C (41°F-104°F), and humidity of 20-80%.

BE CAREFUL AROUND PRINT PAPER EXIT SLIT
Do not insert your hand or any material into the paper exit slit during printing.
Do not touch the cutter blade inside the paper exit slit. Otherwise, your finger will be injured.

DO NOT TOUCH THE THERMAL HEAD AND CUTTER
Do not touch your hand to the thermal head (located inside the unit) and the cutter blade.
The thermal head is heated to high temperature.
This may cause injury.

INSTALLATION LOCATIONS

MAINTAIN GOOD VENTILATION
Ventilation slots and holes are provided on sides of this unit.
Place the unit on a hard and level surface and locate at least 4" (10cm) from walls to ensure proper ventilation.

UNSUITABLE LOCATIONS
Avoid shaky places or hot-springs areas where hydrogen sulfide and acidic ions are likely to be generated.

PLACES WITH HIGH HUMIDITY AND DUST
Do not place the unit at locations with high humidity and/or dust. They can cause extensive damage.
Avoid places where the unit is likely to contact oily fumes and vapors.

PLACES NOT LIKELY TO BE EXTREMELY HOT
Places exposed to direct sunlight, or near heating appliances can attain extremely high temperatures, which may deform the cabinet, or can become a prime cause of damage.

SET THE UNIT ON A FLAT PLACE
Do not use the unit in the state inclined ±20° in vertical or horizontal direction, or in an unstable place.
It will disturb paper feeding or ventilation, or affects the set.

FOR LONG OPERATING LIFE

UNSUITABLE MATERIALS FOR THE UNIT
Many plastic components are used in the backside. Coat flaking and deformation are likely to occur if the unit is wiped with chemical dusters, benzine, thinner or any other solvent, if rubbers or PVC items are left in contact with the unit for extended duration, or if the unit is sprayed with insecticide.

CARE OF THE CABINET
Unplug and clean with a soft cloth slightly moistened with a mild soap and water solution. Allow to dry completely before operating. Never use petroleum base solutions or abrasive cleaners.

HEAD ABRASION
The thermal head, like the video head, wears out.
When it is abraded, it becomes hard to print out fine details of the picture. In such a case, it is necessary to replace the thermal head. Consult with the sales dealer for replacing the head.

WHEN A DEFECT IS FOUND
When you detect smoke or smell from the unit, disconnect immediately the power cord plug from a wall socket and ask the agent for repair. Dangerous if the unit is operated in that state.

CONNECTION DEVICES
Read thoroughly "Operating Precautions" of the instruction booklets for other devices connected with the Digital monochrome printer.
Do not disconnect the power cord during printing.

CAUTION ON RELOCATING
When transporting this unit, make sure it is not likely to be subjected to impacts. They can be a prime cause for damage. Further, make sure to disconnect the power cord from the power outlet, and the cables from the connected devices.

UNPLUG THE POWER CORD DURING A LONG ABSENCE
Turn off the MAIN power switch and unplug the power cord during a long absence.

THERMAL PAPER

■ When the remaining length of the paper is about10" (25cm), a color belt appears at the paper end. Prepare for replacement of the paper. If the remaining paper length is less than 10" (25cm), printing becomes uneven due to the uneven paper core surface.

■ When the Printed paper is touched by wet hand, the print may be discolored.

■ When the paper runs out during printing, the printing operation stops and "EP" is displayed by the indicator on the front panel. Install new paper at this time.

■ Store the printed paper in a place with low humidity free from a direct sunlight.

■ If the paper absorbs nonvolatile organic solvents (alcohol, ester, ketone, etc.) the print may be discolored.
Particularly, if the paper comes in contact with soft vinyl chloride such as a transparent tape, it quickens discoloration.

■ Do not use paper other than the specified one.

■ Immediately after the paper is replaced, 2-3 images may be printed with a blank part due to hand's dust or oil.

■ Avoid a direct sunlight or a place near a heater, and store the paper in a place with 30°C (86°F) or lower temperature and 35-80% RH.

■ When the paper is rapidly transferred from a cool place to a hot place, a vapor or a dew is generated on the paper surface causing paper jam or degraded printing quality.

■ A finger print or dust on the paper surface may degrade the printing quality.

Note:
Mitsubishi brand thermal paper is specially treated with an antistatic coating against thermal head damage caused by static-electricity discharge.
The use of non-treated paper may cause premature head failure in your product.

SAFETY TECHNICAL CHECKS

Periods: According to the recommendations of the manufacturer of medical device.
Scope: a) Visual check
      Housing, cables, operator controls, readout device (displays, LED etc.), labels, accessories,
      instruction manual.
   b) Function test
      Performance check acc. instruction manual, also unity and applicability of set and accessory test.
   c) Electrical check
      Safety electrical test of the configuration in accordance with EN60601-1.

   " In the interest of safety, avoid the handling of liquids beside the set."

RESPONSIBILITY OF THE MANUFACTURER

   The manufacturer, assembler, installer or importer considers himself responsible for the effects on safety, reliability
   and performance of the EQUIPMENT only if:
– assembly operations, extensions, readjustments, modifications or repairs are carried out by persons authorized by
   him, and
– the electrical installation of the relevant room complies with the IEC requirements
– the EQUIPMENT is used in accordance with the instructions for use.

• Any service after expiration of the warranty period will be made at cost. Consult our service station in your place.

TECHNICAL DESCRIPTION

   The supplier will make available on request such circuit diagrams, component part lists, descriptions, calibration
   instructions or other information which will assist the USER's appropriately qualified technical personnel to repair
   those parts of the EQUIPMENT which are classified by the manufacturer as repairable.

   The use of ACCESSORY equipment not complying with the equivalent safety requirements of this equipment may
   lead to a reduced level of safety of the resulting system. Consideration relating to the choice shall include:
   – use of the accessory in the PATIENT VICINITY
   – evidence that the safety certification of the ACCESSORY has been performed in accordance to the appropriate
     EN60601-1 and/or EN60601-1-1 harmonized national standard.

   The transportation and storage environmental conditions are:
      Temperature   : -20°C - +60°C (-4°F - +140°F)
      Humidity : 90%RH or less at 40°C (104°F)
      Note : The above transportation environmental conditions indicate the storage environmental conditions
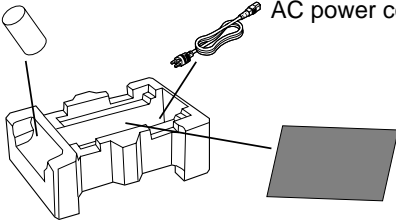   during transport.

3 **UNPACKING**

Take the unit out of the box by the following procedures. Make sure to check the contents.

1 **Open the top of the box.**	3 **Take the unit out of the box carefully.**
	• Make sure to keep the unit horizontal.
2 **Remove the cushion above the unit.**	4 **Unwrap the unit.**

Accessories

Thermal paper

AC power cord

Cleaning paper
Operation manual
Printer driver (1 floppy disk)

4 FEATURES AND FUNCTIONS

Front Panel
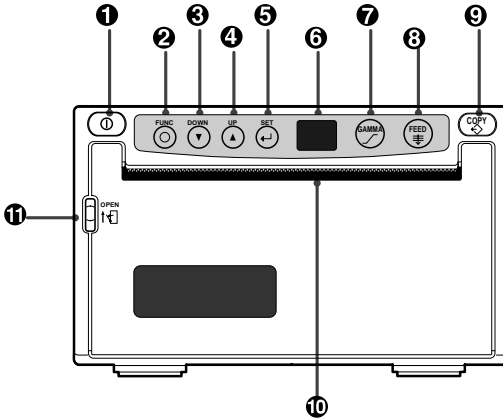
	Name	Function	Reference page
❶	Power switch	Turns on/off the power.	-
❷	FUNC button	Function mode changes whenever FUNC is pressed.	14•15
❸	DOWN button	Press to change the value in function mode.	15
❹	UP button	Press to change the value in function mode.	15
❺	SET button	Press to set each function value and γ-curve.	-
❻	Indicator	Displays stand-by, functions and error messages.	15-17
❼	GAMMA button	Press to change the γ-curve.	13
❽	FEED button	Press to feed the paper.	12
❾	COPY button	Press for additional copies of the previous printout.	11
❿	Print exit/Cutter	Printed paper will come out through this slot. Cut the printed paper here.	-
⓫	Lever	Opens the door.	-

Rear Panel
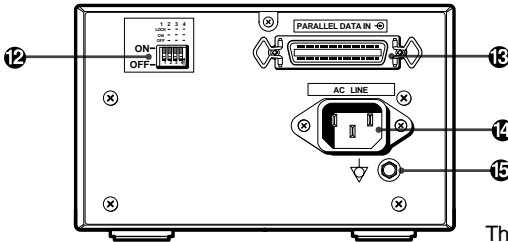
⑮ POTENTIAL EQUALIZATION TERMINAL

This is used to equalize the potential of the equipment connected to this unit.
For details refer to the installation instruction of equipment to be connected.

	Name	Function	Reference page
⑫	Mode switches	Select special functions.	10
⑬	PARALLEL data terminal	Connects to the device equipped with parallel data interface such as personal computer.	10 20 - 22
⑭	Power terminal (AC LINE)	Connect the power cord to this terminal.	-
⑮	Potential equalization terminal	Makes the connected equipment of potential equal.	-

5 INSTALLATION OF PAPER

■ **Moisture, fingerprints or dust on the paper surface may cause a noise at printing or deterioration in print quality. Set the paper in the following procedure to prevent adhesion of fingerprint or dust on the paper surface.**

1 Open the door.
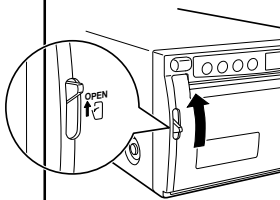
• Switch the lever located on the left side to the **"OPEN"** position.

■ The door opens.

2 Load the paper roll.
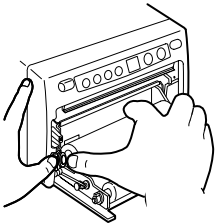
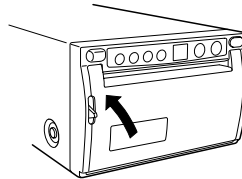•Place the paper roll in the printer.
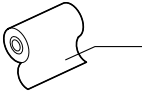
INCORRECT   CORRECT

printing side

Note: The printing surface is the outside. Place the paper with the thermo-sensitive side (printing side) up. When the paper roll is placed inversely, images can not be printed.

3 Pull out the paper end.
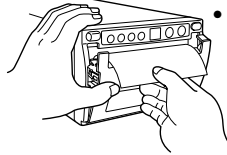
• Pull out the first 15-20cm (6 in. - 9 in.) of the paper to remove any slack in the roll.
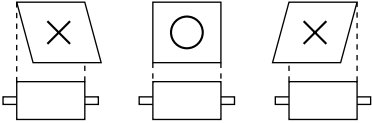
4 Close the door.
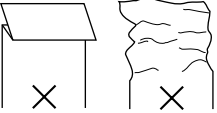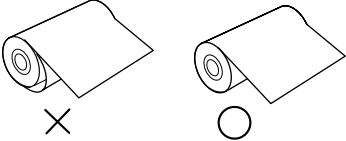

5 Cut the paper end.
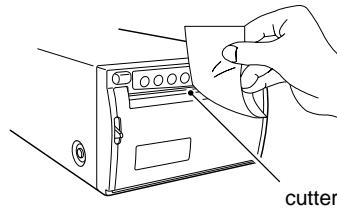
cutter

• Cut the paper end with the cutter just like tearing off the paper.

◼ When setting the paper, observe the following precautions to prevent paper jam.

Do not use defective paper.	
	◼ Do not use the bent or wrinkled paper.

Adjust the paper position correctly.	
	◼ When the paper is fed out skewed from the print exit, adjust the paper position so that it is fed out straight.

Do not slack the roll paper.	
	◼ Set the paper tightly to remove any slack.

If the side of the print paper is uneven or the core is sticking out, the amount of paper feeding after printing may vary.
When the side of paper is uneven or the core is sticking out, install the print paper after making the paper side even.

The core is sticking out.　　　The paper is uneven.　　　Make the paper side even.

INCORRECT　　　　　**CORRECT**

CAUTION

- Keep the high-density paper away from fingerprint, dust or moisture when storing it.
- Do not touch the rubber roller. Do not stain or damage the roller surface.
- Do not touch the thermal head (located behind the cutter). When printing, the thermal head is heated to high temperature.
- Do not touch the cutter blade.

6 EXAMPLE OF CONNECTION

Connecting to various equipment with parallel data interface such as medical equipment and personal computer.

Connection

① Turn off the power switches of the digital monochrome printer and the equipment to be connected.
② Connect the digital monochrome printer with PC or medical equipment through a parallel cable.
③ When inserting the parallel cable to the printer's connector, make sure to fasten the springs at the both sides of the connector to secure the cable.
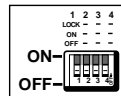
Personal computer or medical equipment

To PARALLEL DATA IN connector

Connect Power cord
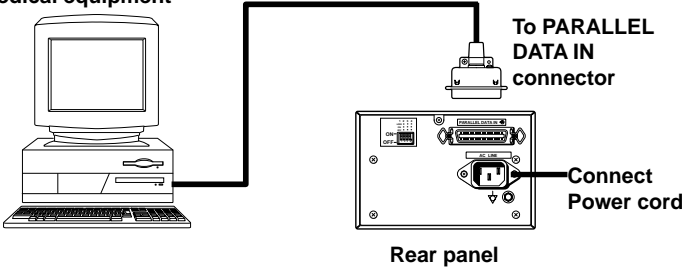
Rear panel

Mode switch setting

Set the mode switches on the rear panel.
• When setting the switch No. 1 to ON, **FUNC**, **DOWN**, **UP**, **SET** and **GAMMA** buttons will be locked. (The functions will not be available.) Set the switches other than No. 1 to OFF.

Installing printer driver

Printer driver is required to print the data from a personal computer connected with this printer.
The printer driver for Windows® is supplied with this printer.

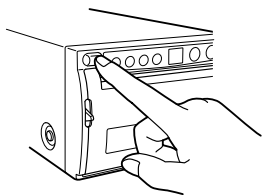| Product name	Operating conditions
For Windows®	Applies for Microsoft® WindowsNT®4.0

Refer to the operation manual of the printer driver or "Read me" for installing.

WindowsNT® is the registered trademarks of Microsoft Corporation in the U.S.A and other countries.

7 PRINTING

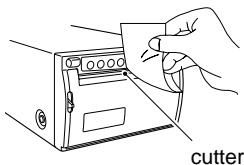## Printing procedure

| **1** Turn on the power.	**3** Cut the printed paper.
• Press the **"POWER"** switch to turn on the power.	cutter • Cut the printed paper with the cutter by tearing off the paper in the upper right direction.
2 Print a picture displayed on the screen.	
• Print a picture with an application software. The image data is transferred through parallel data interface.	

Copy printing

■ You can set the number of copies by pressing the **COPY** button on the front panel. You can copy the same picture as many times as you desire until a new image data is printed.

■ When the **COPY** button is pressed during copy printing, the current image will be completed and the rest will not be printed.

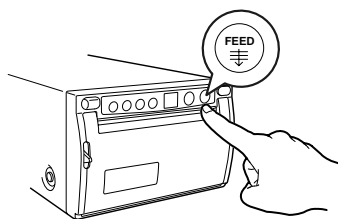■ The set number of the copy printing will not be memorized.
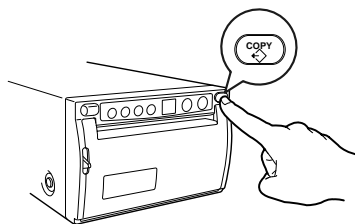
Indicator

1 - 9 : number of copies
C : continuous printing

COPY printing mode

Paper feeding

■ By pressing the **"FEED"** button on the
front panel, you can feed the paper.

Precautions on Printing

■ If printing is continued with a very black picture, the printer will become overheated and
printing will not be available. "EH" is indicated, and the button functions become invalid.
In this case, wait for a while until the unit is cooled down.
■ Avoid pulling out or holding the recording paper during printing or copying.
It can cause paper jam. Do not touch the paper until printing or copying ends.
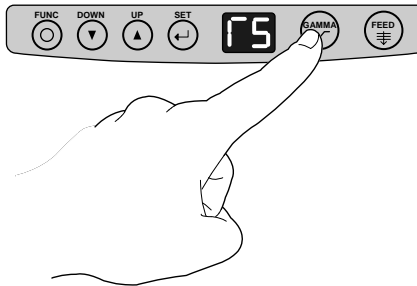
Paper saving mode

■ When the paper saving mode switch is set to " 1 " in the function mode, print feeding
length is shorter than normal condition.
Before cutting the print, press the **FEED** button on the front panel to advance the paper.

8 ADJUSTMENT OF PRINT PICTURE

Selection of Gamma (γ) Curve

■ **You can select γ-curve by pressing the gamma button "⌐".**
Each time the button is pressed, the indicator and γ-curve
number is switched. After a γ-curve number has been
selected, press the "SET" button to store the γ-curve number.

Indicator/Adjustable Item	Adjustable contents
$\boxed{\Gamma 5}$ γ–curve set mode $\boxed{1} \sim \boxed{5}$	■ This is the mode to select the gamma (γ) curve (density diagram characteristic) to get the proper density for each printing image. Select the best one among the five gamma curves.

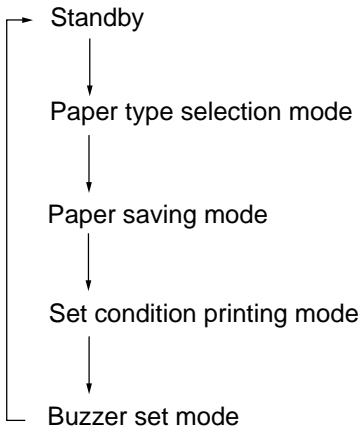# 9 SETTING OF FUNCTION MODE

❶ Select a function mode by pressing the **FUNC** button.
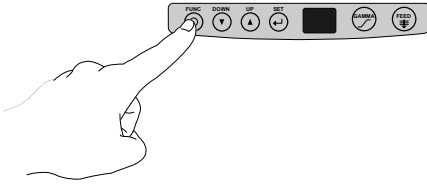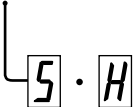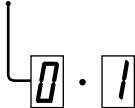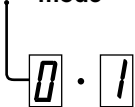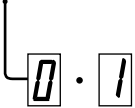
- Each time the **FUNC** button is pressed, the mode is switched as shown below.

```
┌─→ Standby
│        │
│        ↓
│   Paper type selection mode
│        │
│        ↓
│   Paper saving mode
│        │
│        ↓
│   Set condition printing mode
│        │
│        ↓
└── Buzzer set mode
```

❷ Adjust a numeric value by pressing ▼ or ▲ button.

Adjustable items of each function mode are as follows.

Indicator/Adjustable item	Adjustment contents
PH **Paper type selection mode** 5 · H	Mode to select paper type. 5 : Standard paper H : High density paper
o0 **Paper saving mode** 0 · 1	Mode to select paper saving mode. 0 : Paper saving mode OFF 1 : Paper saving mode ON
_0 **Printer condition printing mode** 0 · 1	Mode to select whether the printer conditions will be printed over the image or not. 0 : The printer conditions are not printed. 1 : The printer conditions are printed.
81 **Buzzer set mode** 0 · 1	Mode to select whether the buzzer will sound or not. 0 : Buzzer does not sound. (Sounds only at occurrence of error) 1 : Buzzer sounds.

❸ When completing setting the function, press the **SET** button.
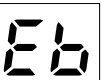
The set functions will not be lost even if the power is turned off.

10 ERROR DISPLAY

When an error in operation occurs, an audible alarm and a visible error is displayed in the LED indicator.

Cause/Error display	Symptom/Remedy
① **No paper** *EP*	[Symptom] • When the paper runs out or the paper is not installed, printing becomes impossible and alarm tone is given. In this case, all the functions of buttons and switches become invalid.
	[Remedy] Install brand-new paper according to "**5. INSTALLATION OF PAPER**" on page 8.

Cause/Error display	Symptom/Remedy
② **Overheat** *EH*	[Symptom] • When the head gets overheated, "*EH*" is displayed on the indicator and alarm tone is given. In this case, all the functions of buttons and switches become invalid.
	[Remedy] Wait until the head is cooled down.

Cause/Error display	Symptom/Remedy
③ **Button input error** *Eb*	[Symptom] • An alarm tone is given once, "*Eb*" is displayed for one second in the indicator, and button operation is nullified in the following cases: • The **COPY** button is pressed first after the power is turned on. • The **DOWN**, **UP**, **SET** or **GAMMA** button is pressed when the MODE switch No. 1 is set to ON. • Any button on the front panel is pressed when one of the other error messages is displayed on the LED.

Cause/Error display	Symptom/Remedy
④ **Door error** Eo	[Symptom] • When the door opens, an alarm tone is given.
	[Remedy] Close the door.

Cause/Error display	Symptom/Remedy
⑤ **Gear lock error** EL	[Symptom] • When the thermal head does not automatically go up after printing, an alarm tone is given. • "EL" is displayed in the indicator and all the functions of buttons and switches become invalid.
	[Remedy] Turn the power off. Then turn it on again.
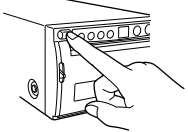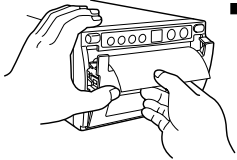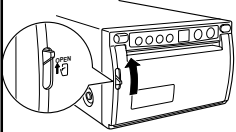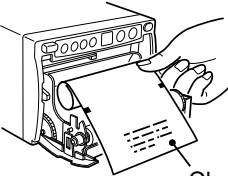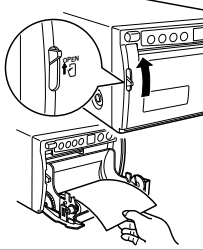
11 STATUS AND MODES

Set state/Mode	LED display		Contents of right side LED display
	Left	**Point and right**	
Power off			Power off
Stand-by	0	0	
Print state	o	o	During data receiving
	$-$	$-$	During printing
Copy state	C	$1 - 9, C$	Number of copies
γ-curve set mode (γ-curve)	Γ	$1 - 5$	γ-curve No.
Paper type setting mode	P	S, H	Standard / High density
Paper saving mode	$\bar{o}$	$0, 1$	Out/ In (OFF/ON)
Set condition printing mode	$-$	$0, 1$	Out/ In (OFF/ON)
Buzzer setting mode	B	$0, 1$	Out/ In (OFF/ON)
Error detect state	E	H	Overheat
		P	No paper
		b	Button input error
		o	Door is open.
		L	Gear lock

12 USE OF CLEANING PAPER

When the thermal head is dirty with dust and perspiration, etc., white spots or stripes may appear on the print. In this case, clean the thermal head in the following procedure BY USING THE SUPPLIED CLEANING PAPER.

1 Turn on the power.

■ Press the "**POWER**" switch to turn on the power.

2 Open the door.

■ Switch the left side lever to the "**OPEN**" position.

3 Insert the cleaning paper.

■ Roll the cleaning paper and install into the set.

Cleaning paper

Red mark

■ Adjust the red mark on the cleaning paper parallel to the platen roller.

Platen roller   Cleaning paper

4 Close the door.

■ Close the door without taking out the cleaning paper.

5 Press the "FEED" button.

■ Keep pressing the "**FEED**" button until you hear a beep.

6 Take out the cleaning paper.

■ Open the door.

■ Take out the cleaning paper.

■ Do not pull out the cleaning paper while the door is closed.

7 Repeat the steps 3-6 by 2 or 3 times, and print 1-2 sheets to verify the cleaning effect.

CAUTION
- It is recommended that after printing 10 rolls of paper the unit be cleaned using the supplied cleaning paper.
- If the symptom of the dirty head is not corrected even after cleaning, your set needs repairing, contact your dealer.
- Do not pull out the sheet and the cleaning paper while the door is closed.
  This may cause extensive damage on the unit.
- Never use other cleaning papers. It may cause damage to the thermal head.
- This cleaning paper should be used only for cleaning the thermal head. Do not use it for other purpose.

13 PARALLEL DATA INTERFACE

- Connector   JD36SL or equivalent (36 pin)
- Input level   TTL
- Parallel input connector port
  Signal allocation (Signal : Compatible)

■ **PARALLEL TERMINAL SIGNAL**

Pin number

```
  18                        1
 ┌─────────────────────────┐
 │ ▢▢▢▢▢▢▢▢▢▢▢▢▢▢▢▢▢▢ │
 │ ▢▢▢▢▢▢▢▢▢▢▢▢▢▢▢▢▢▢ │
 └─────────────────────────┘
  36                       19
```
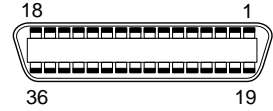
Pin No.	Return pin No.	Signal	From/To	Function
1	19	$\overline{\text{STROBE}}$	PC/DP	Strobe pulse for data reading. Incoming pulse width shoud be 0.5μs minimum. At regular conditions, "High" data will be read after becoming "Low".
2	20	DATA1(LSB)	PC/DP	High: data 1
3	21	DATA2	PC/DP	Low: data 0
4	22	DATA3	PC/DP	
5	23	DATA4	PC/DP	Information will be expressed for parallel data of every signal
6	24	DATA5	PC/DP	from bit No.1 to No.8.
7	25	DATA6	PC/DP	
8	26	DATA7	PC/DP	
9	27	DATA8(MSB)	PC/DP	
10	28	$\overline{\text{ACK}}$ (ACKNOWLEDGE)	PC/DP	The signal is yielded after data input has ended by a data reception acknowledgement pulse.
11	29	BUSY	PC/DP	High: DP data is not accepted. Low: DP data is accepted. The signal becomes "High" in the following cases: • During data entry
12		P•E (PAPAER END)	PC/DP	High: No paper Low: Paper available
13		SELECT	PC/DP	High
14		$\overline{\text{AutoFd}}$	PC/DP	High
16•17		GND	PC/DP	Earth
18		High	PC/DP	PeripheralLogicHigh
19 - 30		GND		Earth
31	16	$\overline{\text{INIT}}$	PC/DP	Clears sending data to this unit. (Low) Incoming pulse width should be 100μs minimum.
32		$\overline{\text{Fault}}$	PC/DP	Low: Abnormal condition occurs in DP. (e.g. error)
15• 33 - 35		NC		Unused
36		$\overline{\text{SelectIn}}$	PC/DP	Low

DP : Digital printer
PC : Personal computer

• Parallel input connector port
  Signal allocation (Signal : Nibble)

Pin No.	Return pin No.	Signal	From/To	Function
1	19	HostClk	PC/DP	High
2 - 9	20 - 27	Unknown	PC/DP	Unknown
10	28	PrtClk	PC/DP	Sends data in "Low" when HostBusy is "Low". After HostBusy turns "High", this signal becomes "High".
11	29	PtrBusy	PC/DP	Data4, Data8(MSB)
12		AckDataReq	PC/DP	Data3, Data7
13		Xflag		Data2, Data6
14		HostBusy	PC/DP	High: DP is on BUSY status. Low: DP can send data.
16•17		GND		Earth
18		High	PC/DP	PeripheralLogicHigh
19 - 30		GND		Earth
31	16	$\overline{\text{Init}}$	PC/DP	Clears sending data to this unit. (Low) Incoming pulse width should be 100µs minimum.
32		$\overline{\text{DataAvail}}$	PC/DP	Data1(LSB), Data5
15•33 - 35		NC		Unused
36		1284 Active	PC/DP	Becomes "High" when DP requests each mode of IEEE1284.

• Parallel input connector port
  Signal allocation (Signal : ECP)

Pin No.	Return pin No.	Signal	From/To	Function
1	19	$\overline{\text{HostClk}}$	PC/DP	Forward data transfer : Becomes "Low" when PeriphAck is "Low" and there is data to be read. Returns to "High" when PeriphAck becomes "High".
2	20	DATA1(LSB)	PC/DP	High: data 1
3	21	DATA2	PC/DP	Low: data 0
4	22	DATA3	PC/DP	
5	23	DATA4	PC/DP	Information will be expressed for parallel data of every signal
6	24	DATA5	PC/DP	from bit No.1 to No.8.
7	25	DATA6	PC/DP	
8	26	DATA7	PC/DP	
9	27	DATA8(MSB)	PC/DP	
10	28	PeriphClk	PC/DP	Reverse data transfer : Sends "Low" data when HostAck is "Low". Returns to "High" when HostAck becomes "High".
11	29	PeriphAck	PC/DP	Forward data transfer: High: DP is on BUSY status. Low: DP can accept data.
12		$\overline{\text{AckReverse}}$	PC/DP	High: Forward data transfer (Receive) Low: Reverse data transfer (Send)
13		Xflag	PC/DP	High: During supporting ECP mode
14		HostAck	PC/DP	Reverse data transfer: High: PC is on BUSY status. Low: PC can send data.
16•17		GND		Earth
18		High	PC/DP	PeripheralLogicHigh
19 - 30		GND	PC/DP	Earth
31	16	Reverse Request	PC/DP	Low : When PC requests DP to send data
32		Periph Request	PC/DP	Low : When DP requests PC to send data
15• 33 - 35		NC		Unused
36		1284 Active	PC/DP	Becomes "High" when DP requests each mode of IEEE1284.

14 MAINTENANCE

Turn off the power for maintenance.

Maintenance of Main Unit

Wipe off stains of the front panel with a soft cloth.
When the panel is heavily stained, wipe of with the cloth
moistened with neutral cleanser diluted by water and finish with
a dry cloth.

Maintenance of Rubber Roller

When the rubber roller is dirty with dust, etc., a black spot may
appear on the print.
In this case, eliminate the dust on to the rubber roller with a
blower or a brush.

Rubber roller
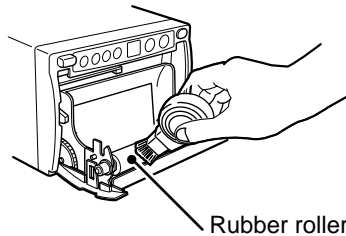
Cleaning of Thermal Head

When the thermal head is dirty with dust, etc., white spots or
stripes may appear on the print.
In this case, clean the thermal head according to "**12. USE OF
CLEANING PAPER**".

Note: After installation of new roll of paper, dust on the paper will
generally require 2 to 3 prints to be made before the dust
is eliminated.

15 SPECIFICATIONS

Type: Digital Monochrome Printer

Model: P91DW

Power supply and
power consumption: 120V AC, 50/60Hz, 1.4A
                                        220-240V AC, 50/60Hz, 0.8A

Connection terminal: Parallel data interface (36 pin female type)

Dot resolution: 1024 x 1024 pixels (Standard)
                                        (Max. 1024 x 5120 pixels)

Gradation: 256 gradations

Printing speed: 5.1 sec (Standard)

Print size: 4" x 4" (100mm x 100mm) (Standard)
                                        (Max. 4" x 20" (100mm x 500mm))

Operating conditions: Temperature 41 - 104˚F (5-40˚C)
                                        Humidity   20 - 80% RH (No dewing)

External dimensions: 6.1" x 3.8" x 11.8" (154mm x 97mm x 300mm); W x H x D

Weight: 6.8 lbs (3.1kg)

Standard accessories: AC power cord .... 1 piece
                                        Thermal paper K65HM .... 1 roll
                                        Cleaning paper .... 1 sheet
                                        Printer driver .... 1 floppy disk

Optional accessory: Thermal paper K65HM, K65H, K61B, K61S

SERVICE INFORMATION

Before requesting service please review this operation manual to correct minor complaints.
If you are unable to correct the problem, consult your MITSUBISHI Dealer or MITSUBISHI
Service Department.

DO NOT ADJUST ANY CONTROLS NOT DESCRIBED IN THIS OPERATION MANUAL.
DO NOT REMOVE THE PROTECTIVE ENCLOSURE OF THIS UNIT.

MITSUBISHI

MITSUBISHI ELECTRONICS AMERICA, INC.
5665 PLAZA DRIVE P.O. BOX 6007
CYPRESS, CA 90630-0007, USA
TEL (714)220-2500   FAX (714)236-6339

Mitsubishi Electric Europe B.V.

UK Branch
Travellers Lane, Hatfield, Herts. AL10 8XB, England, U.K.
Phone (1) 707 276100   FAX (1) 707 278755

German Branch
Gothaer Strasse 8, Postfach 1548, 40880 Ratingen 1, Germany
Phone (2102) 4860   FAX (2102) 486-732

French Branch
25, Boulevard des Bouvets - 92741 NANTERRE cedex
Phone (01) 55.68.55.00   FAX (01) 55.68.57.31

Italian Branch
Centro Direzionale Colleoni, Palazzo Perseo-Ingresso 2,
Via Paracelso 12, 20041 Agrate Brianza, (Milano) Italy
Phone (039) 60531   FAX (039) 6057694

Benelux Branch
Nijverheidsweg 23 A, 3641 RP. Postbus 222, 3640 AE Mijdrecht
Phone 02972-82461   FAX 02972-83936

Spanish Branch (Barcelona)
Sucursal en españa
Polígono Industrial "Can Magí", Calle Joan Bucallà 2-4,
Apartado de Correos 420, 08190 Sant Cugat del Vallês,
Barcelona, Spaín
Phone 93.5653154   FAX 93.5894388

Manufactured by Mitsubishi Electric Corporation
1 Zusho Baba, Nagaokakyo-City, Kyoto Japan

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